Pushing the Envelope			
2007 Mathematics			
Grade Level and High School Content Expectations			
Michigan Mathematics			
Grades 9-12			
Activity/Lesson	**State**	**Standards**	
History of Aviation Propulsion (pgs. 5-9)	MI	MA.9-12.A1.2.9	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Know common formulas and apply appropriately in contextual situations.
Types of Engines (pgs. 11-23)	MI	MA.9-12.A1.2.9	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Know common formulas and apply appropriately in contextual situations.
Chemistry (pgs. 25-41)	MI	MA.9-12.A1.2.9	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Know common formulas and apply appropriately in contextual situations.
Chemistry (pgs. 25-41)	MI	MA.9-12.G2.1.3	Students use and justify relationships between lines, angles, area and volume formulas, and 2- and 3-dimensional representations. They solve problems and provide proofs about congruence and similarity. Know and use the relationship between the volumes of pyramids and prisms (of equal base and height) and cones and cylinders (of equal base and height).

Chemistry (pgs. 25-41)	MI	MA.9-12.G2.3.5	Students use and justify relationships between lines, angles, area and volume formulas, and 2- and 3-dimensional representations. They solve problems and provide proofs about congruence and similarity. Know and apply the theorem stating that the effect of a scale factor of k relating one two-dimensional figure to another or one three-dimensional figure to another, on the length, area, and volume of the figures is to multiply each by k, k², and k³, respectively.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A1.2.1	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Write equations and inequalities with one or two variables to represent mathematical or applied situations, and solve.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A1.2.8	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Solve an equation involving several variables (with numerical or letter coefficients) for a designated variable. Justify steps in the solution.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A1.2.9	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Know common formulas and apply appropriately in contextual situations.

Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.1.1	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Determine whether a relationship (given in contextual, symbolic, tabular, or graphical form) is a function and identify its domain and range.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.1.3	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Represent functions in symbols, graphs, tables, diagrams, or words and translate among representations.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.1.7	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Identify and interpret the key features of a function from its graph or its formula(e).
Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.2.3	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Recognize whether a function (given in tabular or graphical form) has an inverse and recognize simple inverse pairs.

Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.3.1	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Identify a function as a member of a family of functions based on its symbolic or graphical representation; recognize that different families of functions have different asymptotic behavior.
Physics and Math (pgs. 43-63)	MI	MA.9-12.A2.3.2	Students understand functions, their representations, and their attributes. They perform transformations, combine and compose functions, and find inverses. Students classify functions and know the characteristics of each family. They work with functions with real coefficients fluently. Students construct or select a function to model a real-world situation in order to solve applied problems. They draw on their knowledge of families of functions to do so. Describe the tabular pattern associated with functions having constant rate of change (linear); or variable rates of change.
Rocket Activity (pgs. 69-75)	MI	MA.9-12.A1.2.9	Students recognize, construct, interpret, and evaluate expressions. They fluently transform symbolic expressions into equivalent forms. They determine appropriate techniques for solving each type of equation, inequality, or system of equations, apply the techniques correctly to solve, justify the steps in the solutions, and draw conclusions from the solutions. They know and apply common formulas. Know common formulas and apply appropriately in contextual situations.